

It is not, however, of the bird's general habits that I would here speak, but of its plumages, which, it would seem, have not been at all well understood. Of these there are two which are entirely distinct, viz. a light and a dark phase, each having two stages, a juvenile and an adult. So different are these phases that extreme examples might well be mistaken for different species. In life the adult of the light phase has the appearance of a white or albino Hawk; while the adult of the dark phase looks quite black or melanistic.

This dichromatism may aptly be compared with that which distinguishes the American Screech-Owl (*Megascops asio*), with its red and grey phases, since it characterizes the bird in all stages of growth, is dependent upon neither sex nor season, and mating birds may or may not be alike in colour.

The two phases of this Hawk may be described as follows:—

#### LIGHT PHASE.

*Adult stage.*—Head and hind-neck white, or buffy white, the feathers of the former with narrow blackish shaft-streaks, those of the latter tipped with large roundish spots of the same. Sides of head and neck buffy, with more or less brown; back blackish brown; rump lighter brown tinged with ochraceous; primaries blackish brown, the inner webs above the notch white; inner webs of secondaries black barred, and tipped, as are the wing-coverts, with whitish and ochraceous; tail lighter brown, with faint marblings and a wash of ochraceous; rectrices with eight or nine narrow, zigzag, more or less well-defined, blackish bars, which rarely entirely cross the whitish inner webs; under parts buff or rusty buff, with a few feathers (sometimes but one or two) on the flanks with brown shaft-streaks and small terminal spots of same. Legs and feet greenish yellow; soles light yellow; bill blackish, but plumbeous at the base of the lower mandible; iris light hazel.

*Juvenile stage.*—Above and on the sides of the head chocolate-brown, deepest on the hind-neck; the feathers lightly bordered with greyish and rusty; rectrices ashy brown, with irregular bars of blackish across each feather;

below white, the feathers of the breast and sides tinged with ochraceous, and everywhere, except on the throat and belly, with brown spots and shaft-streaks; thighs and tibiae faintly barred and streaked with lighter brown.

The difference between the two stages of the light phase is very great, but a series of twelve specimens shews very clearly the transition from the extremely young bird (probably of the first year) to the final white-headed adult stage. The adult of this phase might well be called the White-headed Hawk. The juvenile is truly a Brown Hawk, as it was called in Cook's time. Successive seasons witness the loss of the heavy brown markings underneath till the almost pure buff of the adult is attained. The younger the bird, the darker the head, and the purer the white of the more brown-streaked under parts. The older the bird, the whiter the head, the fewer and more buffy the brown markings below.

The colour of the iris corresponds to the general coloration of the individual, being very light hazel or dark brown according as the bird is light or dark.

Some excellent illustrations of this Hawk are given in the 'Birds of the Hawaiian Islands' from specimens obtained by Mr. Scott B. Wilson. The buff-coloured bird, however, is of a deeper hue than any specimen which the writer has ever seen, and the head is by no means so white as that of several in the series before him. Nor has he ever seen a specimen in which the tail-markings are so entirely obliterated as in the specimen figured.

The first figure, opposite page 1, is that of a young bird in the juvenile or brown stage, and affords an excellent idea of this stage of the light phase above described. Mr. Gurney, as quoted in the 'Birds of the Hawaiian Islands,' was in error in considering the brown plumage to be that of the adult.

#### • DARK PHASE.

*Adult stage.*—Above blackish brown. Primaries still darker; inner webs above the notch whitish and black barred; secondaries and tertiaries barred across both webs;



it would be contrary to the general law in American Hawks, in which, if I am not mistaken, the barring is better defined and more constant in the adult stage. In the series of specimens in the dark phase, however, the barring of the tail is seen to be more of an individual character. In most, though not all, of the adults the barring is well defined. So it is also in most of the juveniles, but in one, the youngest, perhaps, of the series, it is scarcely indicated at all, and the same remark holds good of two individuals in an intermediate stage.

It is perhaps idle to speculate as to the origin and significance of these two very different phases of plumage. As, however, the dark phase so largely predominates, at least on the rainy and windward side of the island, it has occurred to the writer that the progenitors of this Hawk, when they first came to the island, may have been light-coloured; and that now, after a long residence, the bird is in process of undergoing transformation into an almost black form.

In this connexion it is noticeable that white is almost entirely absent from Hawaiian birds, the majority of which incline strongly towards greens and yellows, with a minority which are clad in red and black. *Chasiempis* alone of the woodland birds exhibits much white in its plumage, and even this bird has less white and is of a deeper and more lustrous brown in the rainy regions of Hawaii than in the drier districts, there being, indeed, two forms or colour-varieties\*.

The feathering of most of the island forms, especially of the *Drepanididæ*, which form the bulk of the indigenous birds both in individuals and species, is exceedingly abundant and compact, and is possessed of deep and lustrous tints, all of which are indicative of a cool and rainy climate, that necessitates a warm covering and confers a rich, though by no means necessarily bright or gaudy, coloration.

It is to be remembered in this connexion, however, that there are at least two American Hawks, *Buteo swainsoni* and

\* A discussion in detail of these colour-varieties will be found in a paper by the author in a recent issue of 'The Auk.'

*B. borealis calurus*, which are dichromatic, as is also the American Screech-Owl; and in neither instance, so far as the writer is aware, is there any cause to believe that the species is changing into darker or lighter forms.

Below are appended the measurements (in inches) of twenty-seven specimens, from which will be apparent at a glance, among other points, the constantly larger size of the female:—

## Males.

| No. | Date.         | Wing. | Tail. | Tarsus. | Bill with cere. | Cere. | Remarks.                  |
|-----|---------------|-------|-------|---------|-----------------|-------|---------------------------|
| 2.  | Dec. 3, 1899. | 10·00 | 6·75  | 2·75    | 1·15            | ·80   | Adult, light phase.       |
| 5.  | Nov. 15, "    | 10·88 | 6·75  | 2·45    | 1·18            | ·75   | Juv., dark phase.         |
| 6.  | June 9, "     | 10·37 | ·00   | 2·70    | 1·08            | ·76   | Juv., light phase.        |
| 7.  | " 9, "        | 10·25 | 6·50  | 2·63    | 1·19            | ·80   | Adult, dark phase.        |
| 8.  | Nov. 4, "     | 10·18 | 6·16  | 2·65    | 1·19            | ·80   | Adult, dark phase.        |
| 9.  | " 14, "       | 10·89 | 6·45  | 2·69    | 1·19            | ·80   | Nearly adult, dark phase. |
| 11. | Feb. 9, 1900. | 10·25 | 6·50  | 2·69    | 1·20            | ·87   | Juv., dark phase.         |
| 15. | " 11, "       | 10·00 | 6·13  | 2·63    | 1·19            | ·84   | Adult, dark phase.        |
| 18. | " 27, "       | 10·12 | 6·75  | 2·68    | 1·19            | ·85   | Adult, light phase.       |
| 20. | Mch. 10, "    | 10·40 | 6·60  | 2·75    | 1·15            | ·80   | Adult, dark phase.        |
| 24. | Sept. 16, "   | 10·25 | 7·00  | 2·88    | 1·15            | ·78   | Adult, light phase.       |
| 25. | " 27, "       | 10·50 | 7·10  | 2·67    | 1·18            | ·87   | Juv. light phase.         |
| 26. | " 27, "       | 10·95 | 6·00  | 2·75    | 1·13            | ·78   | Adult, dark phase.        |
| 27. | Dec. 14, "    | 9·75  | 6·50  | 2·65    | 1·15            | ·77   | Adult, dark phase.        |
| 29. | Apr. 10, "    | 10·50 | 6·12  | 2·75    | 1·15            | ·77   | Adult, dark phase.        |

## Females.

| No. | Date.          | Wing. | Tail. | Tarsus. | Bill with cere. | Cere. | Remarks.                                 |
|-----|----------------|-------|-------|---------|-----------------|-------|--|
| 1.  | Dec. 2, 1899.  | 11·25 | 7·00  | 2·84    | 1·25            | ·95   | Juv., white phase.                       |
| 3.  | " 2, "         | 11·76 | 7·05  | 2·81    | 1·25            | 1·00  | Adult, black phase.                      |
| 4.  | Jan. 12, 1900. | 11·38 | 7·00  | 2·75    | 1·25            | ·95   | Adult, dark phase.                       |
| 10. | " 9, "         | 11·25 | 7·16  | 2·81    | 1·31            | ·94   | Adult, white phase.                      |
| 12. | Feb. 2, "      | 11·65 | 7·25  | 2·81    | 1·33            | 1·00  | Adult, white phase.                      |
| 14. | " 27, "        | 11·13 | 7·00  | 2·81    | 1·33            | 1·00  | Adult, dark phase.                       |
| 16. | " 18, "        | 11·54 | 7·50  | 2·95    | 1·35            | ·97   | Juv., light phase.                       |
| 17. | " 17, "        | 11·27 | 7·25  | 3·00    | 1·37            | 1·07  | Adult, white phase.                      |
| 21. | Apr. 21, "     | 11·75 | 6·90  | 2·85    | 1·30            | 1·00  | Adult, white phase.                      |
| 22. | Mch. 11, "     | 11·88 | 7·10  | 2·95    | 1·38            | 1·00  | { Juv., app. full-grown,<br>light phase. |
| 23. | Aug. 18, "     | 11·13 | 6·50  | 2·85    | 1·37            | 1·00  | Juv., light phase.                       |
| 28. | Apr. 3, "      | 11·30 | 6·75  | 2·85    | 1·40            | 1·00  | { Juv., dark phase; tail<br>worn.        |

XXVI.—*On a Collection of Birds made on the White Nile between Khartum and Fashoda.* By W. R. OGILVIE-GRANT. *With an Introduction and Field-notes by R. M<sup>c</sup>D. HAWKER.*

(Plates X. & XI.)

I. *Short Narrative of the Journey,* by R. M<sup>c</sup>D. HAWKER.

WITH the object of collecting Natural History specimens, I left England at the end of December 1900, my intention being to go up the White Nile as far as its junction with the Sobat, and after travelling thence, in a south-easterly direction through the Nuer country to Lake Rudolf, to return home *viâ* Mombasa.

The Director of the Natural History Museum and Mr. Ogilvie-Grant provided me with letters of introduction to the officials in the Sudan, requesting them to give me every help to further my expedition, and I engaged the services of two taxidermists, Messrs. C. F. Camburn and J. R. Thurston.

Arriving at Port Said on January 1st, 1901, I proceeded to Cairo and called on Sir Rennell Rodd, who, on the production of my letters from the Natural History Museum, arranged with the Financial Secretary to have my heavy baggage passed unopened through the Customs. I also called on Lord Cromer, who kindly gave me a letter to the Sirdar, Sir Reginald Wingate, at Khartum.

On January 9th I was joined by my companion, Mr. G. H. Cheetham; on the 11th our baggage arrived at Cairo, and thanks to Dr. Keatinge, of the Cairo School of Medicine, was re-trucked at once for Chellal. Colonel Gordon, R.E., had kindly arranged with the Sudan Railway to have the baggage transported as soon as possible, so we left Cairo on the 12th with the hope that it would arrive at Khartum soon after us. It did not, however, reach that place till January 27th, and we had the mortification of seeing several shooting-parties, which arrived after us, starting up the White Nile sooner.

I called on the Sirdar and presented Lord Cromer's letter. The Sirdar informed me that we should be helped in every

way, but that we were not to go south of Fashoda. This was a disappointment, as I had made plans to be absent about two years, and had brought stores sufficient for that period. I had left London with the understanding that I should be able to go through to Mombasa, being assured that there would be no objection raised by the authorities, and that I should not require permission from the Foreign Office to do so.

Captain Parker, of the Intelligence Office, kindly arranged for the hire of two murkabs (native sailing-boats) and their crews for our use. These we got partially decked and had grass shelters erected over their sterns. We bought six camels, eight donkeys, and a pony, while a second pony was kindly lent us by Capt. Harold.

Our baggage having at last arrived, we spent several days in re-packing it, and got it and the transport-animals on board on February 1st, but, as that day was a Friday, the rias (captain) objected to starting, as he said that it would bring us bad luck. We let him have his way and started on the 2nd. The wind was from the north, and as the boats sailed well we made from thirty to sixty miles a day. The scenery of the banks on both sides of the river was most monotonous and barren for some distance, and, with the exception of a few very prickly acacias (*Mimosa asperata*) and *Ipomœa asari-folia*, a plant of the convolvulus family, with large green leaves and fruit, the country was almost devoid of vegetation.

There were myriads of Waterfowl and Waders feeding on the mud-banks, and Cranes, Storks, Herons, Spoonbills, Ducks, and Geese swarmed, while flocks of Doves kept flying down to the river to drink. Hippopotamuses and crocodiles, basking on some sand-bank, were occasionally seen. Near Ed-Duem the sunt-tree (*Acacia nilotica*) made its appearance, growing in belts along the river-bank. On the 6th we arrived at El-Kawa, which is about 130 miles south of Omdurman. Here we landed the ponies, as the rias wanted to get stores for the crew, and rode round the town with the Marmoor (Egyptian Magistrate) to see the sights. El-Kawa is built of grass huts, the streets being named after